

IN THE CLAIMS

This listing of the claims replaces all prior listings of claims.

Listing of Claims:

1. (Currently Amended) A magnetic azimuth measurement apparatus comprising:
a magnetic detection unit having ~~two~~ three or more magnetic detection devices with directionality, the magnetic detection devices being disposed at equal angular intervals based on a predetermined rule in such a way that directionalities thereof are different from each another;
a sampling unit for sequentially switching and sampling electromagnetic conversion outputs of magnetic detection devices of the magnetic detection unit;
a condition determining unit for determining whether or not the electromagnetic conversion output being sequentially switched and sampled by the sampling unit meets a predetermined condition; and
an azimuth information output unit for outputting magnetic azimuth information based on a result of the determination of the condition determining unit,
wherein,
each of the ~~two~~ three or more magnetic detection devices of the magnetic detection unit comprises a thin film magnetic core, a thin film excitation coil and a thin film detection coil around the magnetic core, and
the ~~two~~ three or more magnetic detection devices disposed in a wheel-spoke arrangement with their cores positioned to point along their respective axes from a common point.
2. (Cancelled)
3. (Previously Presented) The magnetic azimuth measurement apparatus according to Claim 1, wherein:
each magnetic azimuth device of the magnetic detection unit comprises a magnetic core made of a soft magnetic material, an excitation coil for exciting thereof, and a detection coil for detecting an external magnetic field.

4. (Cancelled)

5. (Currently Amended) The magnetic azimuth measurement apparatus according to Claim 1, wherein:

in the magnetic detection unit, the thin film excitation coils corresponding to the ~~two~~ three or more magnetic detection devices are configured to form one excitation coil is shared by the ~~two~~ three or more magnetic detection devices.

6. (Previously Presented) The magnetic azimuth measurement apparatus according to Claim 5, wherein:

in the magnetic detection unit, all the magnetic detection coils have the same one end.

7. (Cancelled).

8. (Previously Presented) The magnetic azimuth measurement apparatus according to Claim 1, wherein:

the excitation coil and detection coil for each of the magnetic detection devices are formed with a two-layer structure.

9. (Previously Presented) The magnetic azimuth measurement apparatus according to Claim 3, 5, or 6 wherein:

the magnetic core comprises a material that enable provision and elimination of inductive magnetic anisotropy to be carried out with heat treatment in a magnetic field.

10. (Previously Presented) The magnetic azimuth measurement apparatus according to Claim 1, wherein:

the sampling unit switches electromagnetic conversion outputs of the magnetic detection devices, and performs synchronous detection of a switched signal with a predetermined frequency, thereby sampling a voltage change corresponding to an external magnetic strength.

11. (Previously Presented) The magnetic azimuth measurement apparatus according to Claim 1, wherein:

the sampling unit sequentially operates switches in response to a signal from a binary counter if the number of detection coils of the magnetic detection devices is set to be 2^n , the number of the switches being the same as that of the detection coils.

12. (Previously Presented) The magnetic azimuth measurement apparatus according to Claim 1, wherein:

the condition determining unit supplies a trigger signal to the azimuth information output unit as a result of determination if the electromagnetic output being sequentially sampled by the sampling unit is a maximum, a minimum, or zero crossing.

13. (Previously Presented) The magnetic azimuth measurement apparatus according to Claim 12, wherein:

the azimuth information output unit outputs a signal for switching, which is sampled by the sampling unit if the trigger signal is received from the condition determining unit, as information indicating an azimuth of the external magnetic field.

14. (Cancelled)

15. (Currently Amended) A magnetic azimuth measurement apparatus comprising:
a magnetic detection unit having ~~two~~ three or more magnetic detection devices with directionality, the magnetic detection devices being disposed at equal angular intervals based on a predetermined rule in such a way that directionalities thereof are different from each another;
a sampling unit for sequentially switching and sampling electromagnetic conversion outputs of magnetic detection devices of the magnetic detection unit;
a condition determining unit for determining whether or not the electromagnetic conversion output being sequentially switched and sampled by the sampling unit meets a predetermined condition; and

an azimuth information output unit for outputting magnetic azimuth information based on a result of the determination of the condition determining unit,

wherein,

each of the ~~two~~ three or more magnetic azimuth devices of the magnetic detection unit comprises a thin film radial magnetic core, said magnetic core insulated by an insulating layer and made of a soft magnetic material, a thin film excitation coil, and a thin film detection coil around the magnetic core, and

the ~~two~~ three or more magnetic detection devices disposed in a wheel-spoke arrangement with their cores positioned to point along their respective axes from a common point.